Change in the Amazon Basin VOL 2

The frontier after a decade of colonisation

editor

JOHN HEMMING

Samuel Benchimol
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CENTRO DE DOCUMENTAÇÃO E MEMÓRIA DA AMAZÔNIA.

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2 Population changes in the Brazilian Amazon

SAMUEL BENCHIMOL

The complexity and continental size of the Amazon Basin (see Table 1) must arouse our imagination, when we consider its national and world scale:

1/20	of the Earth's surface
1/5	of available freshwater reserves in the world
1/3	of evergreen broad-leaved forest resources
1/10	of the world's living species
2/5	of South American land
3/5	of Brazilian territory

By contrast, the people who inhabit it represent only 3/1000 of the world's population. They number 14 million in the South American Amazon as a whole and about 11 million in the Brazilian Amazon, which consists of the States of Pará, Amazonas, Acre, Rondônia, Mato Grosso, the Federal Territories of Amapá and Roraima, plus Goiás north of the 13th parallel, and the State of Maranhão west of the 44th meridian.

Dramatic change, however, has been noted in the growth and distribution of the Brazilian Amazon population in the decade 1970–80, when it registered a demographic expansion of 54.5%, from 7 256 651 to 11 218 385 inhabitants.

The opening of the economic frontier, the finding and unlocking of mineral and forest resources, the construction of a network of highways, the availability of cheap land and colonisation programmes, all motivated the influx of migrants, tenants and farmers from the Centre–West and South Brazil. The peopling of Amazonia no longer derived exclusively from the poverty-stricken Northeast or depended on river transportation and floodplain settlements. It started to reflect the natural expansion of the southern and savanna frontiers of the Central Brazilian Plateau, along the southern Amazon tributaries of the Madeira, Tapajós, Xingu, Tocantins and Araguaia rivers, and through access provided by new roads in the uplands.

Although the actual population is still insignificant when we consider the 5 million km^2 of the Brazilian part of the Amazon Basin, encompassing 260 million hectares of equatorial rainforest and vast untapped natural and mineral resources, we should emphasise that this fact does not constitute a major obstacle for

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Table 1 River basins of the Brazilian Amazon

States and Territories	*Total*	*Areas of basins (km²)*					
		Amazonia	*Tocantins Araguaia*	*Northeast*	*S. Francisco*	*Paraguai*	*Paraná*
Pará	1 248 042	1 049 002	166 893	32 147	–	–	–
Amapá	140 276	140 276	–	–	–	–	–
Maranhão	328 663	–	30 485	298 178	–	–	–
Amazonas	1 564 445	1 564 445	–	–	–	–	–
Region to be demarcated							
Amazonas Pará	2 680	2 680	–	–	–	–	–
Roraima	230 104	230 104	–	–	–	–	–
Acre	152 589	152 589	–	–	–	–	–
Rondônia	243 044	243 044	–	–	–	–	–
Mato Grosso	881 001	602 327	110 140	–	–	168 534	–
Goiás	642 092	–	494 675	–	2 779	–	144 638
Totals	5 432 936	3 984 467	802 193	330 325	2 779	168 534	144 638

Source: Departamento de Estudos Geográficos do IBGE.

development. The main difficulties are in insufficient knowledge of the humid tropics, rainforest management, soil conservation and agroforestry, and discoveries of new native or exogenous species of plants and animals that could well be adapted to these habitats and environments. These are the great challenges that the Amazonians now have to face, with the help of many dedicated scientists and scholars such as those attending this symposium.

This problem leads to the question of how much population the Amazon can absorb, now and in the future, without spoiling its natural resources and causing irreversible ecological damage. Since the optimal size of a population has a positive correlation with the carrying capacity of an ecosystem, and with the constraints of actual technology, infrastructure of services and environment management, we shall pursue a conservative demographic policy. We must, therefore, be aware that a Chinese or Indian style population explosion would not achieve a balanced social economic development. Simple statistics showing a population increase over the years, as presented in the tables, may not be evidence of progress or improvement in the quality of life and well-being of its people. On the contrary, overpopulation may not only impoverish the people but also cause so much damage and devastation that the natural resources would be irreparably lost in a few generations.

It is important to point out that human settlement and economic activities in the Amazon became viable because of the new technological revolution. Despite many calculated risks, this revolution enabled us to overcome the long distances and to solve many problems: though satellite telecommunication, infra-red radar photography, remote sensing, agroforestry research, rapid and cheaper means of transport, construction of a network of roads (making easier access to previously

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Table 2 Vegetation types of the Brazilian Amazon km²

States and territories	*Land area in km²*	*Humid and super-humid rainforests of Amazonia*					*Sub-tropical rain-forest outside Amazonia*	*Sub-humid forest of the interior*	Cerrado *and* cerradão	Pantanal *complex*	Cach-imbo *complex*	Campos	Campo *liable to flooding*	*Littoral vegetation* (manques, *dunes*, restingas *and beaches)*
		Total	*Super-humid forest of high Amazon*	Terra firme	Igapó	Várzea								
Pará	1 227 530	1 156 648	–	1 081 868	38 456	36 324	–	–	–	–	12 132	33 333	14 559	10 853
Amapá	139 068	110 567	–	108 466	2 101	–	11 076	–	–	–	–	9 739	–	7 686
Maranhão	324 616	99 907	–	99 907	–	–	–	–	183 788	–	–	–	25 048	15 268
Amazonas	1 558 987	1 532 939	364 408	898 824	23 044	246 663	–	–	–	–	–	26 048	–	–
Roraima	230 104	172 924	–	166 340	–	6 584	–	–	–	–	–	57 180	–	–
Acre	152 589	152 006	–	134 650	–	17 356	–	–	–	–	–	583	–	–
Rondônia	243 044	207 986	–	191 514	–	16 472	–	–	20 701	–	–	14 357	–	–
Mato Grosso	881 001	504 667	–	504 667	–	–	–	1 321	294 189	72 987	1 219	6 618	–	–
Goiás	642 036	31 916	–	31 916	–	–	–	68 573	531 172	–	–			
Totals	5 398 975	3 969 560	364 408	3 218 152	63 601	323 399	11 076	69 894	1 029 850	72 987	13 351	158 233	40 212	33 812

Source: Departamento de Estudos Geográficos do IBGE.

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Table 3 Brazilian population growth (1872–1980)

Regions	*Area (km²)*	*Population and percentage increase*								
		1872	*1890*	*1900*	*1920*	*1940*	*1950*	*1960*	*1970*	*1980*
North Rondônia, Acre, Amazonas, Roraima, Pará, Amapá	3 581 180	332 847	476 370 43.1%	695 112 45.9%	1 439 052 107.0%	1 462 420 0.16%	1 844 655 26.0%	2 561 782 38.8%	3 603 860 40.6%	5 890 633 63.4%
Centre-West Mato Grosso do Sul, Mato Grosso, Goiás, Federal District	1 879 455	220 812	320 399 45.1%	373 309 16.5%	758 531 103.2%	1 258 679 65.9%	1 736 965 37.9%	2 942 992 69.4%	5 079 952 72.6%	7 569 668 49.0%
North-East From Maranhão to Bahia	1 548 646	4 638 560	6 002 047 29.4%	6 749 507 12.4%	11 245 921 66.6%	14 434 080 28.3%	17 973 413 24.5%	22 181 880 23.4%	28 111 927 26.7%	34 855 745 24.0%
South-East Minas Gerais Espírito Santo, Rio, São Paulo	924 924	4 016 922	6 104 384 52.0%	7 824 011 28.2%	13 654 934 74.5%	18 345 831 34.4%	22 548 494 22.9%	30 630 728 35.8%	39 853 498 30.1%	51 727 924 29.8%
South Paraná, Santa Catarina, Rio Grande do Sul	577 723	721 337	1 430 715 98.3%	1 796 495 25.6%	3 537 167 96.9%	5 735 305 62.1%	7 840 870 36.7%	11 753 075 49.9%	16 496 493 40.4%	19 035 500 15.4%
Brazil – totals	8 511 928	9 930 478	14 333 915	17 438 434	30 635 605	41 236 315	51 944 397	70 070 457	93 145 730	119 079 470
Percentage increase between censuses			44.3%	21.7%	75.7%	34.6%	26.0%	34.9%	32.9%	27.8%
Geometric media of annual growth			2.01	1.98	2.88	1.49	2.39	2.99	2.89	2.48

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inaccessible areas), and the building of an infrastructure of services, facilities and public utilities.

This advance of scientific knowledge led to recent discoveries of a great variety of minerals, such as manganese, iron, bauxite, kaolin, copper, tin and natural gas in Amapá, Carajás, Marabá, Jarí, Trombetas, Mapuera, Rondônia and Juruá. Mining activities, mostly capital-intensive and labour-saving, allow rational exploitation with a minimum of manpower, and less ecological damage. These findings reinforce our thesis that a region with such a bonanza of minerals and enormous hydroelectrical potential does not need to devastate and sacrifice our forest, which must be preserved and used adequately, since it is a biological endowment, not only to the Amazonians but to all mankind.

So the best guide to formulate an appropriate demographic and economic policy for the Amazon is to follow four rules of action. These guidelines are that all Amazon projects should be ecologically adequate, economically viable, politically acceptable and socially equitable. We have to admit that these guidelines have often been violated and many errors and omissions have been committed, as happens in most countries of the world, including the most developed and industrialised ones.

The population growth pattern of the Brazilian Amazon, which we now describe, shows how we reached the present figure of 11 million people in the Brazilian Amazon and 14 million in the whole Basin. To understand it, we must recall that the demography of the Amazon Basin is divided into five periods.

The first, the pre-Orellana period, in which about 2 million Amerindians lived sparsely dispersed, from the Incas of the Andes to the Tupinambás of the Atlantic coast; from the Caribs and Aruaks of the Guyanas to the Gês and Tapuias of the central plateau of Brazil. Some of them achieved a high degree of cultural accomplishment, for instance, the Incas in Cuzco and Machu Picchu who lived in the upper Amazon rivers of the Urubamba and Ucayali; and the Marajoaras in the Delta. These pre-Orellana Indians were able to develop their social and economic structure using primitive weapons and instruments which were well adapted to the environment and limitations of their diversified ecosystems.

The second period, in the sixteenth century, starts in 1542 with the expedition of Orellana, who first descended the Amazon river from Quito via the Napo. His expedition started the conquest of the Amazon, later disputed by Spaniards, Portuguese, Dutch, French and British. This phase was marked by violent disruption of tribal societies and the total or partial annihilation of Amerindian culture and society, through conquest, slavery and epidemics. In this period Spanish settlements were established in the upper rivers and the peripheries of the Basin, while the Portuguese and their Brazilian descendents established themselves along the main course of the Amazon and the main tributaries. This

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Regions	*Area (km²)*	*Population and percentage increase*								
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North	3 581 180	332 847	476 370	695 112	1 439 052	1 462 420	1 844 655	2 561 782	3 603 860	5 890 635
Rondônia, Acre, Amazonas, Roraima, Pará, Amapá			43.1%	45.9%	107.0%	0.16%	26.0%	38.8%	40.6%	63.4%
Centre-West	1 879 455	220 812	320 399	373 309	758 531	1 258 679	1 736 965	2 942 992	5 079 952	7 569 668
Mato Grosso do Sul, Mato Grosso, Goiás, Federal District			45.1%	16.5%	103.2%	65.9%	37.9%	69.4%	72.6%	49.0%
North-East	1 548 646	4 638 560	6 002 047	6 749 507	11 245 921	14 434 080	17 973 413	22 181 880	28 111 927	34 855 745
From Maranhão to Bahia			29.4%	12.4%	66.6%	28.3%	24.5%	23.4%	26.7%	24.0%
South-East	924 924	4 016 922	6 104 384	7 824 011	13 654 934	18 345 831	22 548 494	30 630 728	39 853 498	51 727 924
Minas Gerais Espírito Santo, Rio, São Paulo			52.0%	28.2%	74.5%	34.4%	22.9%	35.8%	30.1%	29.8%
South	577 723	721 337	1 430 715	1 796 495	3 537 167	5 735 305	7 840 870	11 753 075	16 496 493	19 035 500
Paraná, Santa Catarina, Rio Grande do Sul			98.3%	25.6%	96.9%	62.1%	36.7%	49.9%	40.4%	15.4%
Brazil – totals	8 511 928	9 930 478	14 333 915	17 438 434	30 635 605	41 236 315	51 944 397	70 070 457	93 145 730	119 079 470
Percentage increase between censuses			44.3%	21.7%	75.7%	34.6%	26.0%	34.9%	32.9%	27.8%
Geometric media of annual growth			2.01	1.98	2.88	1.49	2.39	2.99	2.89	2.48

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Table 4 Brazilian urban and rural population (1950–80)

Regions	*Urban*				*Rural*			
	1950	*1960*	*1970*	*1980*	*1950*	*1960*	*1970*	*1980*
North Rondônia, Acre, Amazonas, Roraima, Pará, Amapá	580 867 31.49%	957 718 37.80%	1 626 600 45.13%	3 046 129 51.69%	1 263 788 68.51%	1 604 064 62.20%	1 977 260 54.87%	2 847 007 48.31%
Centre-West Mato Grosso do Sul Mato Grosso, Goiás, Federal District	423 497 24.38%	1 007 228 35.02%	2 437 379 48.04%	5 118 092 67.75%	1 313 468 75.62%	1 935 764 64.98%	2 635 880 51.96%	2 436 777 32.25%
North-East From Maranhão to Bahia	4 744 808 26.40%	7 516 500 34.24%	11 752 977 41.81%	17 585 618 50.44%	13 228 605 73.60%	14 665 380 65.76%	16 358 950 58.19%	17 276 289 49.56%
South-East Minas Gerais, Espirito Santo, Rio, São Paulo	10 720 734 47.55%	17 460 897 57.36%	28 964 601 72.68%	42 848 230 82.79%	11 827 760 52.45%	13 169 831 42.64%	10 888 897 27.32%	8 904 421 17.21%
South Paraná, Santa Catarina, Rio Grande do Sul	2 312 985 29.50%	4 360 691 37.58%	7 303 427 44.27%	11 880 533 62.41%	5 527 885 70.50%	7 392 384 62.64%	9 193 066 55.73%	7 155 896 37.59%
Brazil – totals Percentages urban/rural	18 782 891 36.16%	31 303 034 45.08%	52 084 984 55.92%	80 478 602 67.57%	33 161 506 63.84%	38 767 423 54.92%	41 054 053 44.08%	38 620 390 32.43%

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Table 5 Growth of population of Amazonia (Northern Region) (1872–1980)

	Area (km²)	*1872*	*1890*	*1900*	*1920*	*1940*	*1950*	*1960*	*1970*	*1980*
Para	1 248 042	275 237	328 455	445 356	983 507	944 644	1 123 273	1 550 935	2 167 018	3 411 235
Amapá	140 276	–	–	–	–	–	37 477	68 889	114 359	175 634
Amazonas	1 564 445	57 610	147 915	249 756	363 166	438 008	514 099	721 215	955 235	1 406 354
Roraima	230 104	–	–	–	–	–	18 116	29 489	40 885	79 078
Acre	152 589	–	–	–	92 379	79 768	114 755	160 208	215 299	301 628
Rondônia	243 044	–	–	–	–	–	36 935	70 783	111 064	492 744
Totals	3 578 500	332 847	476 370	695 112	1 439 052	1 462 420	1 844 655	2 601 519	3 603 860	5 866 673

Source: Annual statistics, IBGE

Table 6 Growth of population of Centre-West Region (1872–1980)

	Area	*1872*	*1890*	*1900*	*1920*	*1940*	*1950*	*1960*	*1970*	*1980*
Goiás	642 092	160 395	227 572	255 284	511 919	826 414	1 214 921	1 913 289	2 941 107	3 864 881
Mato Grosso (before division)	–	60 417	92 827	118 025	246 612	432 265	522 044	889 539	–	–
Mato Grosso	881 001	–	–	–	–	–	–	601 042	1 141 236	
Mato Grosso do Sul	350 548	–	–	–	–	–	–	–	999 452	1 386 803
Federal District (Brasilia)	5 814	–	–	–	–	–	–	140 164	538 351	1 176 748
Totals	1 879 455	220 812	320 399	373 309	758 531	1 258 679	1 736 965	2 942 992	5 079 952	7 569 668

Source: Annual statistics, IBGE.

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division was finally recognised by the treaties of Madrid (1750) and S. Ildefonso (1777), which shaped the present political frontiers.

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The fourth period comprised the depression years of the twenties and thirties, when Amazonia lost its monopoly of native rubber and was unable to meet Malayan plantation competition. In those twenty years, from 1920 to 1940, the State of Pará lost about 40 000 inhabitants, Acre around 13 000. The only exception was the State of Amazonas which registered a small gain in population. In fact, Amazonia, having lost its economic base of survival, was depopulated in this period. The regional gross product plummeted from £ 25 000 000 of the boom days of 1910 to about £ 200 000 in 1932. This depression caused a reflux of population from the upper rivers to the main course of the Amazon and the two principal cities of Belém and Manaus. A similar situation affected the Amazon-bound Peruvian, Colombian and Bolivian populations who attempted to survive in Iquitos, Leticia and Cobija.

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As a result of these recent trends and changes, the population has grown considerably. In the Northern Region (six states and two territories) the census data of 1950–70 show that the population doubled from 1 844 655 to 3 603 860 and increased by a further 63.46% in the decade 1970–80 to the present figure of

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5 890 633 inhabitants. If we use the larger concept of the whole Brazilian Amazon Basin, the census data shows that the 5 363 308 inhabitants in 1960 increased to 7 256 651 (35.3%) in 1970 and to 11 218 385 in 1980, with a growth of 54.5% in the last decade. This population now represents 9.4% of the total Brazilian population of about 120 million people.

In this attempt to account for the observed population trends and changes and evaluate their significance, attention will focus first on Rondônia whose population increased by 333.0% in the decade 1970–80. Most of this growth is due to the opening of the frontier by the construction of the BR-364 road linking Cuiabá to Pôrto Velho. New population centres sprang up along this road and cities like Vilhena, Ariquemes, Cacoal, Pimenta Bueno and Ji-Paraná were born. This last, which in 1970 had 8 904 inhabitants, increased by 1 271.0% to 122 124 in 1980. Rondônia is now Amazonia's biggest agricultural centre of perennial and grain agriculture with a record of 300 000 ha of cultivated land, producing about 500 000 bags of coffee and 100 000 arrobas (15 kgs) of cocoa. Most of its farmers migrated from Paraná and Rio Grande do Sul, expelled by labour-saving mechanised soya agriculture which replaced the previous labour-intensive plantation system of coffee farms. This is the first agricultural revolution in Amazonia, generated by the nutrient-rich red-clay soil and by good farmers from the most developed agriculture of southern Brazil.

Table 7 Geographical demography of Brazilian Amazonia

	Area km²	*Population*		*Percentage increase from 1970 to 1980*	*Annual rate of increase per 100 inhabitants*
		1970	*1980*		
Pará	1 227 530	2 161 316	3 411 235	57.8	4.67
Amapá	139 068	114 687	175 634	53.1	4.35
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Amazonas	1 558 987	955 394	1 430 314	49.7	4.12
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Source: Annual statistics.

In the Amazon comprising the State of Mato Grosso and part of Goiás, we found a quite similar pattern. The opening of the above-mentioned BR-364 and of the BR-165 linking Cuiabá to Santarém gave an opportunity for private and government colonisation programmes. In Mato Grosso, the population increased

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Table 8 Demographic Expansion in the Amazonia and Centre-West in the decade 1970–1980

	Resident population		*Urban population*	*Relative increase*	
	1970	*1980*	*1980* %	*1980/70* %	*1970/60* %
1 Eastern Amazonia					
Pará	1 161 316	3 411 235	48.9	57.8	41.7
Amapá	114 687	175 634	59.1	53.1	53.6
	2 276 003	3 586 869	49.4	57.6	
2 Maranhão (entire state)	2 997 576	4 002 679	31.4	33.5	21.2
3 Western Amazonia					
Amazonas	955 394	1 406 354	59.9	47.2	34.8
Roraima	40 915	79 078	61.7	93.2	44.4
Acre	216 209	301 628	43.8	39.5	36.1
Rondônia	113 659	492 744	47.3	333.5	59.1
	1 326 177	2 279 804	54.7	71.9	
4 Mato Grosso (north)	601 042	1 141 236	57.5	89.8	84.3
5 Mato Grosso do Sul	999 452	1 368 803	67.0	36.9	74.5
6 Goiás (entire state)	2 941 107	3 864 881	62.1	31.4	53.6
7 Federal District	538 351	1 176 748	96.7	118.5	283.6
Amazonia and Centre-West – total	11 679 708	17 421 020	53.9	49.1	–
Brazil – total	93 215 311	119 024 600	67.5	27.6	32.9

by 89.8% from 601 042 in 1970 to 1 141 236 in 1980. The highest rate of increase was in the microregion of northern Mato Grosso with 345.0% and upper Guaporé-Jauru with 91.2% increase. In the State of Goiás, in the transitional zone from savanna to tropical rainforest, the lower Araguaia and middle Tocantins have the greatest population gains: settlement there has been facilitated by the opening of the Belém–Brasília paved highway.

In the State of Pará population changed from 2 161 326 in 1970 to 3 411 235 in 1980 (57.8%) as a result of many economic events such as the gold rush in Serra Pelada; the discovery of the Carajás mineral complex and the construction of the first Transamazônica railway from Carajás to Itaqui-Maranhão (890 km); the bauxite mining in Trombetas; the construction of the hydroelectric dam of Tucuruí on the Tocantins river (4 000 000 kW); the Jarí project in Almeirim county; the gold rush and the BR-165 road from Santarém to Itaituba, on the Tapajós river; the colonisation settlements along the Transamazon Highway in Altamira and São Felix do Xingu; the black-pepper plantations and farms along the Belém–Brasília highway in the Bragantina, Guajarina and Tomé–Açu microregions.

In the metropolitan zone of Belém, the population in 1980 reached one million inhabitants, an increase of almost 50.0% over of the previous decade. This increase caused much stress and difficulty for the low-rent classes, as demonstrated by the enlargement of the shanty towns of the *baixadas* of Belém.

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The State of Maranhão on the edge of Amazonia, which is a zone of transition from the dry and drought-ridden land of the Northeast to the tropical rainforest, has the greatest population density. In the 1980 census out of a total of 4 002 679, some 3 341 842 are included in the Amazon part of Maranhão, with an increase of 35.9% over the 1970 population of 2 458 616. Of this total, 68.0% are living in rural areas. Maranhão is the rice-basket of the Amazon having this year produced about 1 500 000 tons along the Tocantins river and in the humid valleys of the Gurupi, Mearim, Pindaré and Itapecurú rivers.

In the State of Amazonas, the population increased from 955 394 in 1970 to 1 430 314 in 1980 (49.7%), concentrated mainly in the city of Manaus, which grew 96.3% in the decade, from 312 160 to 634 759 inhabitants. This was mostly due to the institution of the Free Trade Zone of Manaus in 1967, which created about 50 000 jobs in the new industrial district, specialising in the assembly and manufacture of electronics, motorcycles, watches, jewellery, opticals, jute, textiles, veneer and plywood goods. In the hinterland, the historical trend of concentration in the middle Amazon continued, from the frontier of Pará up to Manacupurú (63.2%) and in the middle and upper Solimões (36.0%), all along the main course of the Amazon river. The northern part of the State of Amazonas registered the lowest density and continues to be remarkably uninhabited, after a population shift from the north to the south of the Basin, perhaps due to ultisol conditions, lean resources and impoverished black-water rivers.

In the territories of Amapá and Roraima there were small absolute gains in population in the decade 1970–80, of 61 947 and 29 163 respectively, although percentage-wise the increases were 53.1% and 93.2% in the last ten years. In the State of Acre, difficulties of river transportation during the summer and erosion and broken terrain along the BR-364 road during the rainy season when the state is isolated from the rest of the country, have hindered colonisation and prospects are dim until these problems are overcome. The population increased by 39.5% in the decade, from 216 200 to 301 628 in 1980.

Conclusion

There has been a remarkable change in the size and distribution of the Amazonian population since World War II when the Brazilian government announced development plans.

Table 9 Urban and rural population ratios (Amazon region, north) 1940–80

Years	*Urban population*	*%*	*Rural population*	*%*	*Total population*
1940	405 792	27·7	1 056 628	72·3	1 462 400
1950	580 867	31·5	1 263 788	68·5	1 844 655
1960	957 718	37·4	1 604 064	62·6	2 561 782
1970	1 626 600	45·1	1 977 260	54·9	3 603 860
1980	3 046 129	51·7	2 847 007	49·3	5 893 136

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Table 10 Urban population ratios 1970–80

	1970			1980			Average annual growth 1970–80
	Total	Urban	Urban percentage	Total	Urban	Urban percentage	
Pará	2 167 018	1 021 966	47·16	3 411 868	1 669 662	48·94	4·67
Amapá	114 359	62 451	54·61	175 634	103 926	59·17	4·35
Amazonas	955 235	405 831	42·48	1 432 066	858 181	59·93	4·12
Roraima	40 885	17 481	42·76	79 153	48 885	61·76	6·81
Acre	215 299	59 307	27·55	301 605	132 174	43·82	3·39
Rondônia	111 064	59 564	53·63	492 810	233 301	47·34	15·80
Northern Region	3 603 860	1 626 600	45·13	5 893 136	3 046 129	51·69	5·04
North-East	28 111 927	11 752 977	41·81	34 861 907	17 585 618	50·44	2·16
South-East	39 853 498	28 964 601	72·68	51 752 651	42 848 230	82·79	2·64
South	16 496 493	7 303 427	44·27	19 036 429	11 880 533	62·41	1·43
Centre-West	5 073 259	2 437 379	48·04	7 554 869	5 118 092	67·75	4·04
Brazil	93 139 037	52 084 984	55·92	119 098 992	80 478 602	67·57	2·48

Table 11 Demographic growth of state capitals 1872–1980

Municipalities of the capital cities	*1872*	*1809*	*1900*	*1920*	*1940*	*1950*	*1960*	*1970*	*1980*
Belém (Pará)	61 997	50 064	96 560	236 402	206 331	254 949	399 222	633 379	934 330
Macapá (Amapá)	–	–	–	–	–	20 594	46 777	86 307	137 698
São Luis (Maranhão)	31 604	29 308	36 798	52 929	85 583	119 785	158 292	265 595	449 877
Manaus (Amazonas)	29 334	38 720	50 300	75 704	106 399	139 620	173 703	312 160	634 759
Boa Vista (Roraima)	–	–	–	–	–	17 247	25 705	36 491	66 769
Rio Branco (Acre)	–	–	–	19 930	16 038	28 246	47 437	70 959	117 113
Pôrto Velho (Rondônia)	–	–	–	–	–	27 244	50 695	64 522	134 621
Cuiabá (Mato Grosso)	35 987	17 815	34 339	33 678	54 394	56 204	56 828	100 865	212 929
Totals	158 922	135 907	217 997	418 643	398 313	663 889	958 659	1 570 648	2 688 096

Source: Annual statistics, IBGE

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From 1940 to 1980, the population of the Northern Region increased from 1 844 665 to 5 890 633 inhabitants. If we consider the Brazilian Amazon Basin (Amazônia Legal), the present population is 11 218 385 – an increase of 54.5% over the 1970 Census, representing an average yearly growth of 4.45%. Most of this increase occurred rapidly in towns and cities where the ratio of urban to rural population increased from 27.7% in 1940 to 51.7% in 1980, creating problems of shanty towns, *palafitas* and *favelas* as happens in so many Latin American cities.

The forested uplands and interfluvia were crossed by a web of pioneer roads such as the Belém–Brasília, the Transamazon Highway, Cuiabá–Santarém, Cuiabá–Pôrto Velho–Rio Branco, Pôrto Velho–Manaus–Bôa Vista–Caracas serving as the backbone of the system. New migrants settled along these roads while the traditional population remained along the river banks or fled from their homes to the shanty outskirts of towns and cities, requiring a large social investment in housing, education and public utilities.

Despite the partial failure of some colonisation projects established on poor oxysols and ultisols along the Transamazon Highway, other projects located on the eutrophic soils along that road and in the southwest in Rondônia are achieving good results. These successes indicate that when experienced farmers work on a nutrient-rich soil and use cultivation methods adequate to the environment, combining perennial-tree cash crops with short-cycle grain for subsistence, the outcome has been positive.

Another observed trend is that the settlement of the Amazon no longer depends exclusively upon the poverty-stricken Northeast, acting as a safety valve to relieve its demographic pressures, economic distress and political strife. The area is now receiving migrants, tenants and farmers from the Brazilian Centre-West and South. It seems that the development of the region will be a natural expansion of the southern and the savanna frontier of the Central Brazilian plateau, fostered by improvements in scientific knowledge, discoveries of new resources and intelligent use of appropriate technology for the humid tropics.

Amazon development must be ecologically and scientifically sound and socially oriented. Well-intentioned government policies and incentives are not enough. They may be distorted and lead to an economic rush to cut, slash and burn, dig and drill, at the expense of human welfare and wilderness values. Unless such policies are accompanied by the creation of a new agroforestry ecosystem for the benefit of man, the results will be wasteful.

Balancing development and conservation to humanise and improve the natural ecosystems for the well-being of Brazil's people and of her South American neighbours with whom are shared the Amazon condominium; this is the great challenge of our generation.

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Amapá	114 687	175 634	59.1	53.1	53.6
	2 276 003	3 586 869	49.4	57.6	
2 Maranhão (entire state)	2 997 576	4 002 679	31.4	33.5	21.2
3 Western Amazonia					
Amazonas	955 394	1 406 354	59.9	47.2	34.8
Roraima	40 915	79 078	61.7	93.2	44.4
Acre	216 209	301 628	43.8	39.5	36.1
Rondônia	113 659	492 744	47.3	333.5	59.1
	1 326 177	2 279 804	54.7	71.9	
4 Mato Grosso (north)	601 042	1 141 236	57.5	89.8	84.3
5 Mato Grosso do Sul	999 452	1 368 803	67.0	36.9	74.5
6 Goiás (entire state)	2 941 107	3 864 881	62.1	31.4	53.6
7 Federal District	538 351	1 176 748	96.7	118.5	283.6
Amazonia and Centre-West – total	11 679 708	17 421 020	53.9	49.1	–
Brazil – total	93 215 311	119 024 600	67.5	27.6	32.9

by 89.8% from 601 042 in 1970 to 1 141 236 in 1980. The highest rate of increase was in the microregion of northern Mato Grosso with 345.0% and upper Guaporé-Jauru with 91.2% increase. In the State of Goiás, in the transitional zone from savanna to tropical rainforest, the lower Araguaia and middle Tocantins have the greatest population gains: settlement there has been facilitated by the opening of the Belém–Brasília paved highway.

In the State of Pará population changed from 2 161 326 in 1970 to 3 411 235 in 1980 (57.8%) as a result of many economic events such as the gold rush in Serra Pelada; the discovery of the Carajás mineral complex and the construction of the first Transamazônica railway from Carajás to Itaqui-Maranhão (890 km); the bauxite mining in Trombetas; the construction of the hydroelectric dam of Tucuruí on the Tocantins river (4 000 000 kW); the Jarí project in Almeirim county; the gold rush and the BR-165 road from Santarém to Itaituba, on the Tapajós river; the colonisation settlements along the Transamazon Highway in Altamira and São Felix do Xingu; the black-pepper plantations and farms along the Belém–Brasília highway in the Bragantina, Guajarina and Tomé–Açu microregions.

In the metropolitan zone of Belém, the population in 1980 reached one million inhabitants, an increase of almost 50.0% over of the previous decade. This increase caused much stress and difficulty for the low-rent classes, as demonstrated by the enlargement of the shanty towns of the *baixadas* of Belém.

The State of Maranhão on the edge of Amazonia, which is a zone of transition from the dry and drought-ridden land of the Northeast to the tropical rainforest, has the greatest population density. In the 1980 census out of a total of 4 002 679, some 3 341 842 are included in the Amazon part of Maranhão, with an increase of 35.9% over the 1970 population of 2 458 616. Of this total, 68.0% are living in rural areas. Maranhão is the rice-basket of the Amazon having this year produced about 1 500 000 tons along the Tocantins river and in the humid valleys of the Gurupi, Mearim, Pindaré and Itapecurú rivers.

In the State of Amazonas, the population increased from 955 394 in 1970 to 1 430 314 in 1980 (49.7%), concentrated mainly in the city of Manaus, which grew 96.3% in the decade, from 312 160 to 634 759 inhabitants. This was mostly due to the institution of the Free Trade Zone of Manaus in 1967, which created about 50 000 jobs in the new industrial district, specialising in the assembly and manufacture of electronics, motorcycles, watches, jewellery, opticals, jute, textiles, veneer and plywood goods. In the hinterland, the historical trend of concentration in the middle Amazon continued, from the frontier of Pará up to Manacupurú (63.2%) and in the middle and upper Solimões (36.0%), all along the main course of the Amazon river. The northern part of the State of Amazonas registered the lowest density and continues to be remarkably uninhabited, after a population shift from the north to the south of the Basin, perhaps due to ultisol conditions, lean resources and impoverished black-water rivers.

In the territories of Amapá and Roraima there were small absolute gains in population in the decade 1970–80, of 61 947 and 29 163 respectively, although percentage-wise the increases were 53.1% and 93.2% in the last ten years. In the State of Acre, difficulties of river transportation during the summer and erosion and broken terrain along the BR-364 road during the rainy season when the state is isolated from the rest of the country, have hindered colonisation and prospects are dim until these problems are overcome. The population increased by 39.5% in the decade, from 216 200 to 301 628 in 1980.

Conclusion

There has been a remarkable change in the size and distribution of the Amazonian population since World War II when the Brazilian government announced development plans.

Table 9 Urban and rural population ratios (Amazon region, north) 1940–80

Years	*Urban population*	*%*	*Rural population*	*%*	*Total population*
1940	405 792	27·7	1 056 628	72·3	1 462 400
1950	580 867	31·5	1 263 788	68·5	1 844 655
1960	957 718	37·4	1 604 064	62·6	2 561 782
1970	1 626 600	45·1	1 977 260	54·9	3 603 860
1980	3 046 129	51·7	2 847 007	49·3	5 893 136

Table 10 Urban population ratios 1970–80

	1970			1980			Average annual growth 1970–80
	Total	Urban	Urban percentage	Total	Urban	Urban percentage	
Pará	2 167 018	1 021 966	47·16	3 411 868	1 669 662	48·94	4·67
Amapá	114 359	62 451	54·61	175 634	103 926	59·17	4·35
Amazonas	955 235	405 831	42·48	1 432 066	858 181	59·93	4·12
Roraima	40 885	17 481	42·76	79 153	48 885	61·76	6·81
Acre	215 299	59 307	27·55	301 605	132 174	43·82	3·39
Rondônia	111 064	59 564	53·63	492 810	233 301	47·34	15·80
Northern Region	3 603 860	1 626 600	45·13	5 893 136	3 046 129	51·69	5·04
North-East	28 111 927	11 752 977	41·81	34 861 907	17 585 618	50·44	2·16
South-East	39 853 498	28 964 601	72·68	51 752 651	42 848 230	82·79	2·64
South	16 496 493	7 303 427	44·27	19 036 429	11 880 533	62·41	1·43
Centre-West	5 073 259	2 437 379	48·04	7 554 869	5 118 092	67·75	4·04
Brazil	93 139 037	52 084 984	55·92	119 098 992	80 478 602	67·57	2·48

Table 11 Demographic growth of state capitals 1872–1980

Municipalities of the capital cities	*1872*	*1809*	*1900*	*1920*	*1940*	*1950*	*1960*	*1970*	*1980*
Belém (Pará)	61 997	50 064	96 560	236 402	206 331	254 949	399 222	633 379	934 330
Macapá (Amapá)	–	–	–	–	–	20 594	46 777	86 307	137 698
São Luís (Maranhão)	31 604	29 308	36 798	52 929	85 583	119 785	158 292	265 595	449 877
Manaus (Amazonas)	29 334	38 720	50 300	75 704	106 399	139 620	173 703	312 160	634 759
Boa Vista (Roraima)	–	–	–	–	–	17 247	25 705	36 491	66 769
Rio Branco (Acre)	–	–	–	19 930	16 038	28 246	47 437	70 959	117 113
Pôrto Velho (Rondônia)	–	–	–	–	–	27 244	50 695	64 522	134 621
Cuiabá (Mato Grosso)	35 987	17 815	34 339	33 678	54 394	56 204	56 828	100 865	212 929
Totals	158 922	135 907	217 997	418 643	398 313	663 889	958 659	1 570 648	2 688 096

Source: Annual statistics, IBGE

From 1940 to 1980, the population of the Northern Region increased from 1 844 665 to 5 890 633 inhabitants. If we consider the Brazilian Amazon Basin (Amazônia Legal), the present population is 11 218 385 – an increase of 54.5% over the 1970 Census, representing an average yearly growth of 4.45%. Most of this increase occurred rapidly in towns and cities where the ratio of urban to rural population increased from 27.7% in 1940 to 51.7% in 1980, creating problems of shanty towns, *palafitas* and *favelas* as happens in so many Latin American cities.

The forested uplands and interfluvia were crossed by a web of pioneer roads such as the Belém–Brasília, the Transamazon Highway, Cuiabá–Santarém, Cuiabá–Pôrto Velho–Rio Branco, Pôrto Velho–Manaus–Bôa Vista–Caracas serving as the backbone of the system. New migrants settled along these roads while the traditional population remained along the river banks or fled from their homes to the shanty outskirts of towns and cities, requiring a large social investment in housing, education and public utilities.

Despite the partial failure of some colonisation projects established on poor oxysols and ultisols along the Transamazon Highway, other projects located on the eutrophic soils along that road and in the southwest in Rondônia are achieving good results. These successes indicate that when experienced farmers work on a nutrient-rich soil and use cultivation methods adequate to the environment, combining perennial-tree cash crops with short-cycle grain for subsistence, the outcome has been positive.

Another observed trend is that the settlement of the Amazon no longer depends exclusively upon the poverty-stricken Northeast, acting as a safety valve to relieve its demographic pressures, economic distress and political strife. The area is now receiving migrants, tenants and farmers from the Brazilian Centre-West and South. It seems that the development of the region will be a natural expansion of the southern and the savanna frontier of the Central Brazilian plateau, fostered by improvements in scientific knowledge, discoveries of new resources and intelligent use of appropriate technology for the humid tropics.

Amazon development must be ecologically and scientifically sound and socially oriented. Well-intentioned government policies and incentives are not enough. They may be distorted and lead to an economic rush to cut, slash and burn, dig and drill, at the expense of human welfare and wilderness values. Unless such policies are accompanied by the creation of a new agroforestry ecosystem for the benefit of man, the results will be wasteful.

Balancing development and conservation to humanise and improve the natural ecosystems for the well-being of Brazil's people and of her South American neighbours with whom are shared the Amazon condominium; this is the great challenge of our generation.

Secretaria de Estado
de Cultura e
Economia Criativa

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